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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/670,201	09/26/2003	Tetsufumi Tsuzaki	50212-541	4494
20277	7590	05/31/2005	EXAMINER	
MCDERMOTT WILL & EMERY LLP 600 13TH STREET, N.W. WASHINGTON, DC 20005-3096			LEPISTO, RYAN A	
			ART UNIT	PAPER NUMBER
			2883	

DATE MAILED: 05/31/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/670,201

Applicant(s)

TSUZAKI ET AL.

Examiner

Ryan Lepisto

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 September 2003.
2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration.
5) ☐ Claim(s) ____ is/are allowed.
6) ☒ Claim(s) 1-15 is/are rejected.
7) ☐ Claim(s) ____ is/are objected to.
8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 26 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1/04.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: ____.

DETAILED ACTION

Specification

1. The title of the invention is objected to. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Raman amplifier, optical coupler, optical transmission line and the method of making thereof.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 1-3 and 9-10** are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of **Wu (US 6,275,627 B1)** and **"Elimination of water peak in optical fibre taper components"**, Birks, T.A.; Kenny, R.P.; Oakley, K.P.; Cryan, C.V., Electronics Letters, volume 26, issue 21, 11 October 1990, pages 1761-1762 (Birks).

Wu teaches an optical coupler formed by fusion splicing by CO2 laser source or arc fusion splicer (column 5 lines 45-48) a first optical fiber (24) with a small mode field diameter with a second optical fiber (34) with a larger mode field diameter (formed by expanding the mode field diameter) (hybrid type coupling).

Wu does not teach expressly the increase of transmission loss at 1380 nm being less than 0.1 dB.

Birks teaches using a heating source of butane/oxygen flame to heat tapered couplers to create a transmission loss increase of less than 0.1 dB between a band of 1300 nm to 1550 nm (Introduction).

Wu and Birks are analogous art because they are from the same field of endeavor, fusion splicing optical fibers with tapered cores and different sized mode field diameter fibers (hybrid fiber coupling).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the heating source as taught by Birks in the process as taught by Wu since Birks teaches the method of using a butane/oxygen flame can be used in tapers and couplers in transmission system using commercially supplied couplers and for WDM channels and generally in any coupler needed good broadband performance (Introduction and Practical implications sections) and therefore would work in any know coupling scenarios including the one taught by Wu

The motivation for doing so would have been to increase efficiency by reducing the loss due of the fiber at 1380 nm.

3. **Claims 4-8** are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Wu and Birks as applied to claims 1-3 and 9-10 above, and further in view of **Yamada et al (US 2003/0056547 A1)** (Yamada).

Wu and Birks teach the fiber coupling method described above used to reject claims 1-3 and 9-10.

Wu and Birks do not teach expressly using the couplers as Raman amplifier.

Yamada teaches that known art Raman amplifiers use hybrid fibers coupled to single-mode fibers.

Wu with Birks and Yamada are analogous art because they are from the same field of endeavor, fusion splicing optical fibers with different sized mode field diameter fibers (hybrid fiber coupling).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the teachings of Yamada that known Raman amplifiers consist of the structure and method taught by Wu and Birks and therefore the structure of Wu and Birks would not be destroyed by choosing correct fibers to create Raman amplifiers.

The motivation for doing so would have been increase functionality of the coupler by allowing it to generate many different wavelengths from a single wavelength source.

4. **Claims 11-14** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kato et al (US 2001/0019653 A1)** (Kato) and what would have been obvious to a person of ordinary skill in the art.

The following passage is from chapter 2100, section 2112.02 of the MPEP:
PRODUCT-BY-PROCESS CLAIMS ARE NOT LIMITED TO THE MANIPULATIONS OF
THE RECITED STEPS, ONLY THE STRUCTURE IMPLIED BY THE STEPS

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"[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted) (Claim was directed to a novolac color developer. The process of making the developer was allowed. The difference between the inventive process and the prior art was the addition of metal oxide and carboxylic acid as separate ingredients instead of adding the more expensive pre-reacted metal carboxylate. The product-by-process claim was rejected because the end product, in both the prior art and the allowed process, ends up containing metal carboxylate. The fact that the metal carboxylate is not directly added, but is instead produced in-situ does not change the end product.). The structure implied by the process steps should be considered when assessing the patentability of product-by-process claims over the prior art, especially where the product can only be defined by the process steps by which the product is made, or where the manufacturing process steps would be expected to impart distinctive structural characteristics to the final product. See, e.g., In re Garner, 412 F.2d 276, 279, 162 USPQ 221, 223 (CCPA 1979) (holding "interbonded by interfusion" to limit structure of the claimed composite and noting that terms such as "welded," "intermixed," "ground in place," "press fitted," and "etched" are capable of construction as structural limitations.)<

ONCE A PRODUCT APPEARING TO BE SUBSTANTIALLY IDENTICAL IS FOUND
AND A 35 U.S.C. 102 /103 REJECTION MADE, THE BURDEN SHIFTS TO THE
APPLICANT TO SHOW AN UNOBTAINABLE DIFFERENCE

"The Patent Office bears a lesser burden of proof in making out a case of prima facie obviousness for product-by-process claims because of their peculiar nature" than when a product is claimed in the conventional fashion. In re Fessmann, 489 F.2d 742, 744, 180 USPQ 324, 326 (CCPA 1974). Once the examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobtainable difference between the claimed product and the prior art product. In re Marosi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983) (The claims were directed to a zeolite manufactured by mixing together various inorganic materials in solution and heating the resultant gel to form a crystalline metal silicate essentially free of alkali metal. The prior art described a process of making a zeolite which, after ion exchange to remove alkali metal, appeared to be "essentially free of alkali metal." The court upheld the rejection because the applicant had not come forward with any evidence that the prior art was not "essentially free of alkali metal" and therefore a different and unobtainable product.). Ex parte Gray, 10 USPQ2d 1922 (Bd. Pat. App. & Inter. 1989) (The prior art disclosed human nerve growth factor (b-NGF) isolated from human placental tissue. The claim was directed to b-NGF produced through genetic engineering techniques. The factor produced seemed to be substantially the same whether isolated from tissue or produced through genetic

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engineering. While the applicant questioned the purity of the prior art factor, no concrete evidence of an unobvious difference was presented. The Board stated that the dispositive issue is whether the claimed factor exhibits any unexpected properties compared with the factor disclosed by the prior art. The Board further stated that the applicant should have made some comparison between the two factors to establish unexpected properties since the materials appeared to be identical or only slightly different.)

Kato teaches an optical fiber product that transmits light in a band including a wavelength of 1380 nm and has a mode field diameter wherein an increase in transmission loss at 1380 nm is less than 0.1 dB (paragraph 0029).

Kato does not teach expressly the process of forming such fiber by heating a region with a heat source using a fuel not containing pure hydrogen.

Kato does teach a fiber with identical properties as the final product stated by applicant in these claims.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art that fibers with identical final properties are going to behave in the same manner and will be able to be used in the same applications.

The motivation for doing so would have been to increase efficiency by reducing the loss due to the OH group of the fiber at 1380 nm (paragraph 0025).

5. **Claim 15** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Hirano et al (US 2001/00179673 A1)** (Hirano) and what would have been obvious to a person of ordinary skill in the art.

Please note again the section of the MPEP recited above.

Hirano teaches an optical fiber transmission line with many different embodiments of fibers (each having a different diameter, therefore implying different mode field diameters) that may be fusion spliced together to form the transmission line (paragraph 0068) with at least one of the fibers being one that transmits light in a band including a wavelength of 1380 nm and has a mode field diameter wherein an increase in transmission loss at 1380 nm at least less than 0.3 dB/km (paragraph 0073).

Kato does not teach expressly the process of forming such fiber by heating a region with a heat source using a fuel not containing pure hydrogen:

Kato does teach a fiber with identical properties as the final product stated by applicant in these claims.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art that fibers with identical final properties are going to behave in the same manner and will be able to be used in the same applications. In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).

The motivation for doing so would have been to increase efficiency by reducing the loss due of the fiber at 1380 nm.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Document 1 from the applicant's disclosure (1st NPL document in IDS), Krause (US 4,689,065), Cohen et al (US 5,074,633), Kato et al (US 2002/0114594 A1), Hsu et al (US 4,954,152) and Chandan et al (US 6,811,329 B2) teach fusion splicing fiber with different mode field diameters (Hsu teaches identical fibers only) using fuel sources other than ones containing pure hydrogen as a constitutive but do not result in transmission loss increases of less than or equal to 0.1 dB at 1380 nm.
- The following reference are pertinent to the state of the art at the time of applicant's invention: Novel Laser Fusion Processes of Fabricating Low-Loss S-band WDM Narrowband Coupler Devices Overcome H₂O Resonant Absorption, Xu Liu; Sidick, E.; Yang, Y.; Bachman, M; Li, G.P., Optical Fiber Communications Conference, 2003. OFC 2003, 23-28 March 2003 Pages 321-323, vol. 1., Kuhl et al (US 4,604,119), Sahinci et al (US 6,464,410 B1), Gleason et al (US 4,557,557), Krause et al (US 4,713,105), Mortimore et al (US 4,900,114), Yamada et al (US 4,978,201), Forrester (US 5,142,603), Yanagawa et al (US 5,301,252), Takahashi et al (US 5,321,790), Lin et al (US 5,398,296), Emmons et al (US 5,588,087), Gonthier et al (US 5,694,512), Berkey (US 5,917,109), Morozov et al (US 6,208,798 B1), Matsuo et al (US 2002/0061175 A1), Berkey

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(US 6,422,042 B1), Berkey et al (US 2002/0102083 A1), Grudin et al (US 2003/0021302 A1), Tallent et al (US 2004/0033023 A1), Tsuzaki et al (US 2004/0062495 A1), Chandan et al (US 6,779,930 B1), Chapman et al (US 6,830,386 B1).

7. Note that the office takes the different heat sources stated by the applicant (deuterium and oxygen, an electric heater and a laser) as obvious variant of each other since the applicant states that any may be used (page 5 lines 3-7). Therefore, if any prior art references have one of the three, the other two would be obvious variants and would be use in a 103(a) rejection if needed. If the applicant argues that these three sources are not obvious variants of the method, then restriction would be proper to separate this non-obvious variant (distinct, mutually exclusive species).

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan Lepisto whose telephone number is (571) 272-1946. The examiner can normally be reached on M-F 7:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Ryan Lepisto

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Date: 5/18/05



Frank Font

Supervisory Patent Examiner

Technology Center 2800